

REMARKS

By the above actions, claims 18, 20, 27 and 33 have been amended to correct the informalities therein, and in a manner consistent with paragraphs [0015] and [0016] of the specification. In view of the actions taken and the following remarks, reconsideration of this application is requested.

In the response to the 35 USC 112, second paragraph, rejection of claims 27 and 33, claims 27 and 33 have been amended to properly depend from claims 26 and 32, respectively, such that the pending claims are in compliance with 35 USC 112 so that the rejection on the basis is requested to be withdrawn.

Claims 18-39 were rejected based upon Falkenberg (WO 01/27429 A1), Glorieux et al. (EP 0 250 386 A2), and Newby et al. (USP 5,512,341). To the extent that these rejections relate to claim independent 18, as amended, they are inapplicable for the following reasons.

An object of the invention of independent 18 includes providing an insulating glass unit which is simple and cost effective to manufacture, and which has a sufficiently tightly sealed pane intermediate space, even in the event of frequent and rapid air pressure changes. Air pressure changes result in pane movements, which can lead to cracks, and therefore damage the intermediate space, because a diffusion gap between the glass panes and sealing elements can change, or overstress of the gap seals or detachment of the gap seals from the panes can occur (see, e.g., paragraphs [0013] and [0016] of the specification).

In order to overcome the above disadvantages, the basic idea of the invention of independent 18 includes providing, besides the known gap seals, a cushion which essentially comprises an elastic material and which is situated directly between the known gap seal and a gas-tight middle part of the sealing element, for setting a distance between the glass panes. The position and the elastic properties of the cushion ensure that distance changes between the panes and/or twists of the panes are transmitted to the cushion and compensated for there.

Accordingly, the invention of independent claim 18 includes the following order of components of the sealing element: pane – gap seal – cushion – middle part – gap seal – pane, such that the cushion directly joins the gap seal on one side and the middle part on the other side.

Thus, claim 18, as amended patentably distinguishes the present invention from Falkenberg, Glorieux et al., and Newby et al., because these references, taken alone or in combination, fail to disclose, teach or suggest an insulating glass unit, wherein at least one diffusion-tight cushion, which essentially comprises an elastic material, presses directly against each of two gap seals, and is situated directly adjoining a middle part, so that the cushion ensures that distance changes between panes and/or twists of panes are transmitted to the cushion and compensated for there.

By contrast, with respect to Falkenberg, the present Office Action correlates the adhesive sealant 4 of Falkenberg with the gap seal of the invention of claim 18, and the filling material 14 of Falkenberg with the cushion of the invention of claim 18. However, with such an interpretation of Falkenberg, with respect to the invention of claim 18, as amended, the direct contact of the filling material 14 to the middle part 2 of Falkenberg is not disclosed, taught or suggested. Similarly, the direct contact of the filling material 14 with the gap seal 4 of Falkenberg also is not disclosed, taught or suggested.

In addition, with respect to the relative positions of the filling material 14 and the middle part 2 of Falkenberg, another gap seal 4, as well as a film strip 8, are provided between the two parts in Falkenberg. This is not the case, according to the invention of amended claim 18.

Furthermore, with regard to the position of the filling material 14, concerning the outer adhesive sealant 4 of Falkenberg, a film strip 8 is also provided therebetween in Falkenberg. Therefore, in Falkenberg no direct contact between the filling material 14 and the gap seal/adhesive sealant 4 is provided, as required by claim 18, as amended.

Moreover, the filling material 14 of Falkenberg is not disclosed as being responsible for compensating for displacements between the spacer element and the pane, as required by amended claim 18. For example, the relevant means for compensating for such movements would be the film strip 8 of Falkenberg, and which is provided in a U-shaped manner, as shown in FIG. 3 of Falkenberg. In addition, in the description of Falkenberg, the filling material 14 is not disclosed as being essential, and could just be replaced by an air gap (see, e.g., FIG. 2, and page 9, lines 13-15 of Falkenberg). Therefore, the filling material 14 of Falkenberg would not lead one of ordinary skill to the cushion of amended claim 18.

Finally, even if one refers to the alternative embodiment shown in FIG. 6 of Falkenberg, there is no direct contact between the filling material 14, on the one hand, and the adhesive sealant 4, on the other hand.

With respect to the Examiner's assertion in the present Office Action regarding the two seals 4 of Falkenberg, the two seals 4 of Falkenberg do not disclose, teach or suggest both the gap seal and the cushion according to the invention of amended claim 18. This is due to the fact that the seal 4 of Falkenberg is definitely not disclosed as or suited for compensating for displacements between the spacer element and a pane, because of the narrow dimensions of the sealant (see, e.g., page 1, lines 27-29 of Falkenberg).

Therefore, the subject matter of claim 18, as amended, patentably distinguishes the present invention from anything disclosed or suggested by Falkenberg. In addition, the concept disclosed in Falkenberg focuses on the provision of a pliable film strip. In contrast thereto, the invention of claim 18 recites a three-dimensional cushion. Furthermore, one of ordinary skill in the art would find no motivation change the concept of usage of a pliable film strip, as taught by Falkenberg, by the provision of a cushion, as claimed in amended claim 18, absent impermissible hindsight use of Applicant's disclosure. Consequently, the subject matter of claim 18, as amended, is neither anticipated nor obvious in view of Falkenberg.

Similarly, the invention of amended claim 18 patentably distinguishes the present invention from the disclosure Glorieux et al. Specifically, the Office Action correlates element 27 of Glorieux et al. with the two lateral gap seals of the invention of claim 18, and element 18 of Glorieux et al. with the cushion of claim 18. However, such an interpretation of Glorieux et al. is improper, because element 27 denotes a "glass strip" (see, e.g., page 11, line 10 of Glorieux et al.). This glass strip is provided for purposes of electrical insulation between a metal layer 4 and an intermediate section 16 (see, e.g., page 11, lines 25-30 of Glorieux et al.). The glass strip 27 is not provided for sealing purposes, and the glass strip 27 is an optional element of the transparent heat radiation panel disclosed in Glorieux et al., because it can be omitted if the metal layer 4 is covered with a screen 23 (see, e.g., page 11, lines 25-30 of Glorieux et al.), and further demonstrating that it only serves its disclosed function and not the compensation function of amended claim 18.

In addition, element 18 shown in FIG. 8 of Glorieux et al. is just disclosed as a normal sealing plug (see, e.g., page 11, lines 14-18 of Glorieux et al.). Therefore, the sealing plugs 18 of Glorieux et al. might be correlated with the two gap seals of the invention of claim 18, but with such an interpretation, no cushion is disclosed in Glorieux et al., as required by the invention of amended claim 18. Furthermore, there is no disclosure in Glorieux et al. that the sealing plugs 18 have special elastic properties and can insure that distance changes between the two glass panes and/or twists of the panes can be transmitted to the sealing plugs 18 and can be compensated for there, as required by the invention of amended claim 18. Instead, it has to be assumed that the sealing plugs have the normal properties of gap seals known in the art, and which are not suited to achieve the advantages of the invention of amended claim 18. In other words, if distance or torsion changes between the two panes occur, a diffusion gap between the glass strips 27 and the sealing plug 18 can change in Glorieux et al., and it is possible that overstressing of the sealing plugs 18 occurs, which leads to detachment of the sealing plugs from the glass strips in Glorieux et al.

Furthermore, since the object of the avoidance of cracks, etc., due to distance changes and torsion between the two panes, is not at all mentioned in Glorieux et al., the subject matter of claim 18 is also not obvious in view of Glorieux et al. Consequently, the subject matter of claim 18, as amended, is also not anticipated or obvious in view of Glorieux et al.

Similarly, the invention of amended claim 18 patentably is distinguished from Newby et al. Specifically, in the Office Action, the Examiner correlates element 8 with the cushion of claim 18. However, such interpretation is improper, first of all, because element 8 of Newby et al. may not be regarded separately from the metal substrate portion 7 of Newby et al. correlated in the Office Action as the intermediate portion of claim 18. Instead, the metal substrate portion 7 and the polymer coating 8 are formed into a metal-polymer composite by a heat-activated adhesive at the interface therebetween. This metal-polymer composite is the key aspect of the Newby et al.'s disclosure. According to Newby et al., a metal-polymer composite can be used as a glass spacer while eliminating both concerns over differential expansion between the metal component and the polymer component, and the potential for fogging of the glass brought about by volatiles when adhesives are used (see, e.g., column 3, lines 44-50 of Newby et al.). In other words, a composition of a glass spacer comprising a

metal part, on the one hand, and a polymer part, on the other hand, was already known in the art. However, then, the problem of differential expansion between the metal component and the polymer component – say in the glass spacer itself – could not be overcome, as with the invention of claim 18, as amended.

In addition, the polymer coating 8 of Newby et al. does not act as a cushion, which ensures that distance changes between the panes and/or twists of the panes are transmitted to the cushion and can be compensated for there, and as required by claim 18, as amended. According to the invention of claim 18, the gas-tight middle part of the sealing element is rather stiff, and just the cushion, which essentially comprises an elastic material and has appropriate dimensionality, is able to compensate for distance changes or torsion of the panes. In contrast thereto, the combination of the metal component and the polymer component having a metal-polymer composite formed in-between in Newby et al., merely ensures that the differential expansion between the metal component and the polymer component becomes the same.


Furthermore, Newby et al. does not disclose, teach or suggest the polymer coating 8 pressing directly against the moisture barrier material 14 forming a gap seal in the sense that active pressure is carried out. Without this active pressure, the polymer layer 8 cannot compensate for distance changes or torsions, as with the invention of claim 18, as amended.

Therefore, since the object of the avoidance of cracks, etc., due to distance changes and torsion between the two panes, is not at all mentioned in Newby et al., the subject matter of claim 18 is also not rendered obvious by the Newby et al. disclosure. Consequently, the subject matter of amended claim 18, is also not anticipated or rendered obvious by the Newby et al. disclosure.

Moreover, the combination of Falkenberg, Glorieux et al., and Newby et al., fails to cure the noted deficiencies therein since they all lack the compensation feature as recited amended claim 18. Accordingly, since the subject matter of amended claim 18 cannot be derived from anything taught or suggested by Falkenberg, Glorieux et al., and Newby et al., alone or in combination, the outstanding rejections should be withdrawn and action to that effect is requested.

Therefore, in the absence of new and more relevant prior art being discovered, this application should now be in condition for allowance and action to that effect is requested. However, while it is believed that this application should now be in condition for allowance, in the event that any issues should remain, or any new issues arise, after consideration of this response which could be addressed through discussions with the undersigned, then the Examiner is requested to contact the undersigned by telephone for the purpose of resolving any such issue and thereby facilitating prompt approval of this application.

Respectfully submitted,



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